

Reports from vessel weather stations and the testimony of the flyers themselves indicate that the conditions experienced were substantially as forecast.

No storm warnings were issued, and southerly gales on the Washington coast and Puget Sound on the 25th occurred without warning. They were associated with a disturbance in the Gulf of Alaska which appeared from data on the weather chart to be of only ordinary intensity, and which displayed no characteristics justifying the display of flags.

The fire hazard was subnormal for the most part, and most of the warnings which were issued related to the danger of fire arising from lightning storms. The hazard in northern California, however, increased markedly during the closing days of June, consonantly with the reconstruction of the oceanic high-pressure system and its ensuing invasion of the forecast district on the 27th. Effective warnings of this development were issued for the areas affected.—*T. R. Reed.*

RIVERS AND FLOODS

By R. E. SPENCER

In addition to the continuation of the Illinois River flood and the great flood in the Mississippi River and to scattered minor rises in the interior rivers of Ohio, Colorado, and California, important floods occurred in the Wabash system of Indiana, the streams of the St. Louis, Mo., district, the lower Arkansas and its tributaries, the Rio Grande, and the Columbia River System. Report on the floods of the Mississippi and the St. Louis district, including the Illinois, and that in the Columbia (which had not subsided at the close of the month) will be made later; the others having results of any consequence are discussed below:

Wabash system.—Heavy rain on May 18 and 19, when the streams were already comparatively full, resulted in a rise to flood stage over practically the entire Wabash River and in the main stream and West Fork of the White; and further showers thereafter continued the flood stages well into the first decade of June. Warnings were issued well in advance of the flood and were accurately verified, resulting in a saving in movable property estimated at \$35,000. Unavoidable losses were as follows: Tangible property, \$5,000; prospective crops, \$191,600; suspension of business, \$26,300. Owing to the lateness of the season, the delay in planting occasioned by this rise will doubtless result in a considerable reduction in some crops.

Topeka, Kans., district.—Of the floods in this district the official in charge of the Weather Bureau office at Topeka reports as follows:

June, 1927, was marked by overflows in the basins of the Solomon, Saline, Smoky Hill, Osage (Marais des Cygnes), Cottonwood, and Neosho Rivers in Kansas. The chief damage was to growing crops, especially wheat and corn. Wheat was approaching maturity and the high water came too late to replant corn. Approximately 50,000 acres of crop land were flooded, much of it for several days. The estimated damage by river basins was as follows: Solomon Basin, \$70,000; Smoky Hill Basin, including the Saline Basin, \$20,000; Cottonwood Basin, \$100,000; Neosho Basin, \$350,000. The damage in the Osage Basin was small as the high water there lasted only a day or two.

The two overflows in the upper Solomon River at Beloit, Kans., caused comparatively little loss, but the later flood of this stream (from June 13 to 16) resulted in heavy crop damage. The official at Topeka reports further that the most important rise of the month was that which began in the Cottonwood, Neosho, and Osage Rivers after heavy rains on the night of June 18-19, whose effect was augmented by another heavy downfall on the night of 19-20. Warnings were in the main ample and very well verified.

Fort Smith and Little Rock, Ark., districts.—The effect of the floods in Kansas and of heavy local rains from June 17 to 24, was reflected in the lower Neosho River and the Arkansas River between Wyandotte, Okla., and Fort Smith, Ark., in the overflow of about 500 acres of land. Resultant damage amounted to about \$10,000. But in the Verdigris Basin of Kansas—mainly Montgomery County—considerably greater damage occurred, 25,000 acres of land having been inundated, with the following resultant losses: Prospective crops, \$150,000; mature crops, \$50,000; real property, \$2,500.

In the Little Rock, Ark., district no direct destruction by the floods is reported; but they of course prolonged the inundation of lands still under water from the great flood of the previous months, so that for the most part planting in the affected area will have to be abandoned for the 1927 season.

Rio Grande.—The official in charge of the Weather Bureau office at Brownsville, Tex., reports that—

heavy to excessive rains from the 22d to about the 25th of June, extending from Starr County evidently across the Rio Grande into the watershed of the San Juan River of northern Mexico, caused a flood of considerable proportions during the last decade of June in the Rio Grande from Rio Grande, Tex., to the mouth of the river.

Figures on the losses occasioned by this rise were very incomplete, but—

according to reports, Willacy County, beyond the control levees, suffered the greatest acreage of inundation. Cameron County came next with considerable lands flooded, especially toward the coast and in the coast sections, while comparatively small acreages were flooded in Hidalgo and Starr Counties. Probably between one-third and one-half of the lands flooded were under cultivation and in crops, and the total monetary value of the various damages and losses from this flood, it is believed, will go well over \$150,000.

Reports as to the value of Weather Bureau warnings were also very few, but those received indicate a saving of at least \$50,000 in mature crops and livestock, and prove that the advices were of value as an aid to irrigation companies in preparing for the approaching flood.

This report is further interesting from the point of view of effective flood control by levees:

Although, apparently, the volume of water passing Rio Grande, Tex., during this flood was considerably greater than that of the average flood that comes to the Rio Grande Valley, and equal to some of the serious Rio Grande floods of the past, the flood control levees (in an advanced stage of construction now) in Hidalgo and Cameron Counties controlled the great volume of water and prevented a repetition of the widespread inundations of the past from a similar volume of water. In the main only lowlands in sections where the levees are yet unfinished, and of course lands between the control levees—a total of many thousand acres—were inundated.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
Ohio:	Feet			Feet	
Mount Vernon, Ind.	35	3	7	36.0	June 6
Shawneetown, Ill.	35	(1)	10	39.7	6
Cairo, Ill.	45	2	14	49.7	9
Tuscarawas: Gnadenbutter, Ohio	9	5	6	9.3	5
Walhonding: Walhonding, Ohio	8			10.7	4
Hocking: Athens, Ohio	17	12	12	17.2	12
Scioto: Circleville, Ohio	10	6	6	11.0	6
Kentucky: Beattyville, Ky	30	(1)	1	34.8	May 31
Wabash:					
Lafayette, Ind.	11	5	7	13.6	June 6
Covington, Ind.	16	(1)	(2)	24.1	May 21-22
		6	7	17.0	June 7
Terre Haute, Ind.	16	(1)	2	20.9	May 30
Vincennes, Ind.	14	(1)	10	22.3	June 2
Mount Carmel, Ill.	16	(1)	12	24.8	2
Tippecanoe: Norway, Ind.	6	(1)	13	6.5	May 19,
					June 4, 5, 7
		23	23	6.1	23
White: Decker, Ind.	18	(1)	5	22.9	1
White, West Fork: Edwardsport, Ind.	15	(1)	3	18.4	May 26, 30
Holston: Rogersville, Tenn.	14		(2)	17.2	31
Mississippi:					
Quincy, Ill.	14	(1)	(2)	15.3	26
		4	8	16.5	June 5
Hannibal, Mo.	13	(1)	10	17.0	6
Louisiana, Mo.	12	(1)	10	15.8	6
		13	16	13.7	14
Grafton, Ill.	18	(1)	18	22.8	8
Alton, Ill.	21	(1)	19	26.9	8
St. Louis, Mo.	30	4	11	33.0	8
		15	15	30.0	15
Chester, Ill.	27	(1)	18	30.6	9
Cape Girardeau, Mo.	30	(1)	20	35.6	9
New Madrid, Mo.	34	1	19	39.4	10-11
Cottonwood Point, Mo.	34	5	17	36.2	12
Memphis, Tenn.	35	7	22	39.0	14-15
Helena, Ark.	44	8	25	48.0	16-18
Vicksburg, Miss.	45	(1)	(2)	58.7	May 4
Natchez, Miss.	46	(1)	(2)	56.5	1, 4
Angola, La.	45	(1)	(2)	57.5	15-17
Baton Rouge, La.	35	(1)	(2)	47.8	15
Donaldsonville, La.	28	(1)	(2)	37.1	May 15-17
New Orleans, La.	17	(1)	12	21.0	Apr. 25
Illinois:					
Morris, Ill.	13	4	6	16.9	June 5
Peru, Ill.	14	(1)	26	22.8	May 26
Henry, Ill.	10	(1)	25	17.4	28
Peoria, Ill.	18	(1)	21	23.9	28
Havana, Ill.	14	(1)	(2)	22.05	June 8
Beardstown, Ill.	14	(1)	(2)	25.2	Apr. 26
Pearl, Ill.	12	(1)	(2)	22.7	26-27
Meramec:					
Steeleville, Mo.	12	2	2	17.8	June 2
Pacific, Mo.	11	(1)	6	19.6	4
Valley Park, Mo.	14	(1)	6	22.3	4
St. Francis:					
St. Francis, Ark.	17	(1)	17	26.4	Apr. 18
Marked Tree, Ark.	17	(1)	18	20.1	May 10
Missouri:					
Blair, Nebr.	16	21	(2)	16.8	June 26
Hermann, Mo.	21	5	7	21.8	7
St. Charles, Mo.	25	4	10	27.6	7
		14	14	25.2	14
		23	28	26.0	25
Smoky Hill:					
Mentor, Kans.	22	23	25	23.8	25
Solomon, Kans.	24	19	23	26.4	21
Saline: Tescott, Kans.	27	18	20	28.1	18
Solomon:					
Beloit, Kans.	18	5	7	25.2	7
		13	16	23.0	16
Niles, Kans.	26	19	20	26.9	20
Grand, West Fork: Gallatin, Mo.	20	4	5	29.1	4
Grand:					
Chillicothe, Mo.	18	4	6	25.6	6
Brunswick, Mo.	12	6	7	12.5	17
		14	15	12.2	15
Grand, Thompsons Fork: Trenton, Mo.	20	4	4	20.2	4
Osage:					
Quenemo, Kans.	30	20	21	31.1	20
Ossola, Mo.	20	21	23	23.9	22
Warsaw, Mo.	22	2	4	26.6	3
		21	24	26.1	21
Tuscumbia, Mo.	25	2	6	32.15	4
		24	25	25.95	24
Arkansas:					
Webbers Falls, Okla.	23	23	23	23.1	23
Fort Smith, Ark.	22	23	23	22.5	23
Dardanelle, Ark.	20	24	25	20.2	24
Yanoopin, Ark.	29	(1)	(2)	48.5	Apr. 20
Neosho:					
Leroy, Kans.	24	19	20	25.1	June 19
Iola, Kans.	15	20	21	17.0	20
Oswego, Kans.	17	19	27	22.4	22
Fort Gibson, Okla.	22	21	23	24.0	22
Cottonwood:					
Elmdale, Kans.	32	20	20	34.4	20
Emporia, Kans.	20	21	24	24.5	22
Canadian: Logan, N. Mex.	4			6.0	13

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE—continued					
Petit Jean: Danville, Ark.	Feet			Feet	
	20	2	8	22.5	June 7
		22	22	20.0	22
White:					
Calico Rock, Ark.	18	21	21	22.5	21
Batesville, Ark.	23	4	4	23.6	4
		22	22	26.8	22
Newport, Ark.	26	5	11	27.8	8
		23	23	26.1	23
Georgetown, Ark.	22	7	15	22.5	11-12
Black:					
Leeper, Mo.	11	1	2	13.8	1
Williamsville, Mo.	11	1	1	16.2	1
Poplar Bluff, Mo.	14	2	6	18.0	3
Corning, Ark.	11	(1)	28	16.2	Apr. 18
Black Rock, Ark.	14	Mar. 18	29	30.2	15
Cache: Patterson, Ark.	9	June 9	20	9.7	June 14-16
		27	(2)		
Yazoo: Yazoo City, Miss.	25	(1)	(2)	37.4	May 5
Tallahatchie: Swan Lake, Miss.	25	(1)	8	31.8	Mar. 22
Sulphur: Ringo Crossing, Tex.	20	24	25	21.1	June 25
Ouachita: Monroe, La.	40	(1)	17	48.2	May 4
Atchafalaya:					
Melville, La.	37	(1)	13	46.8	14-16
Morgan City, La.	8	(1)	25	9.7	June 10
WEST GULF DRAINAGE					
Little: Little River, Tex.	30	14	15	37.7	15
Rio Grande:					
San Marcial, N. Mex.	2	(1)	5	3.8	May 9, 10, 21
		11	29	3.6	June 13
Riogrande, Tex.	21	22	24	29.8	23
		26	27	24.0	27
Mission, Tex.	22	24	29	24.6	25
San Benito, Tex.	23	24	(2)	24.6	25
Brownsville, Tex.	18	26	(2)	18.4	28
PACIFIC DRAINAGE					
Colorado: Parker, Ariz.	7	(1)	(2)	10.0	May 23,
					June 24, 26
Colorado, Roaring Fork:					
Carbondale, Colo.	5	8	11	5.1	11
		27	28	5.5	28
Gunnison: Delta, Colo.	9	9	11	9.2	9-10
		16	17	9.6	16
		19	20	9.0	10-20
		28	29	10.0	28
San Juan: Farmington, N. Mex.	8	29	30	14.0	30
San Joaquin: Friant, Calif.	12	14	14	12.0	14
Kings: Piedra, Calif.	12	7	8	12.5	7
		13	17	12.5	14
Columbia:					
Marcus, Wash.	24	4	(2)	32.2	19-20
Vancouver, Wash.	15	(1)	(2)	23.9	18-20
Kootenai: Bonners Ferry, Idaho.	26	10	21	30.1	14
Pend O'Reille: Newport, Wash.	16	4	(2)	23.7	22-23
Clearwater: Kamiah, Idaho.	14	7	11	15.2	8
Willamette: Portland, Oreg.	15	(1)	(2)	23.0	19-20

1 Continued from last month.
2 Below flood stage at 8 a. m., June 1.
3 Continued at end of month.

MEAN LAKE LEVELS DURING JUNE, 1927				
BY UNITED STATES LAKE SURVEY				
[Detroit, Mich., July 6, 1927]				
The following data are reported in the "Notice to Mariners" of the above date:				
Data	Lakes 1			
	Superior	Michigan and Huron	Erie	Ontario
Mean level during June, 1927:				
Above mean sea level at New York	Feet 602.33	Feet 579.43	Feet 572.20	Feet 246.11
Above or below—				
Mean stage of May, 1927	+0.37	+0.29	+0.25	+0.16
Mean stage of June, 1926	+1.83	+1.02	+0.96	+0.80
Average stage for June, last 10 years	+0.45	-0.88	-0.29	-0.27
Highest recorded June stage	-1.10	-4.17	-2.32	-2.52
Lowest recorded June stage	+1.83	+1.02	+1.02	+1.22
Average departure (since 1860) of the June	+0.27	+0.23	+0.18	+0.14

¹ Continued from last month.

² Below flood stage at 8 a. m., June 1.

³ Continued at end of month.

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Mean stage of June, 1926.....	+1.83	+1.02	+0.96	+0.80
Average stage for June, last 10 years.....	+0.45	-0.88	-0.29	-0.37
Highest recorded June stage.....	-1.10	-4.17	-2.32	-2.52
Lowest recorded June stage.....	+1.83	+1.02	+1.02	+1.22
Average departure (since 1860) of the June level from the May level.....	+0.27	+0.23	+0.18	+0.14

¹ Lake St. Clair's level: In June, 1927, 574.73 feet.

¹ Continued from last month.

² Below flood stage at 8 a. m., June 1.

³ Continued at end of month.